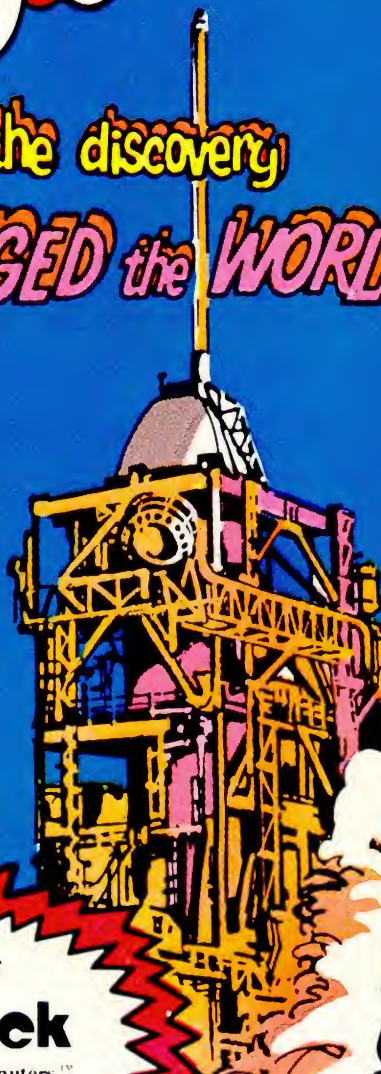


The Science Fair® story of

electronics

...the discovery
that *CHANGED* the *WORLD!*



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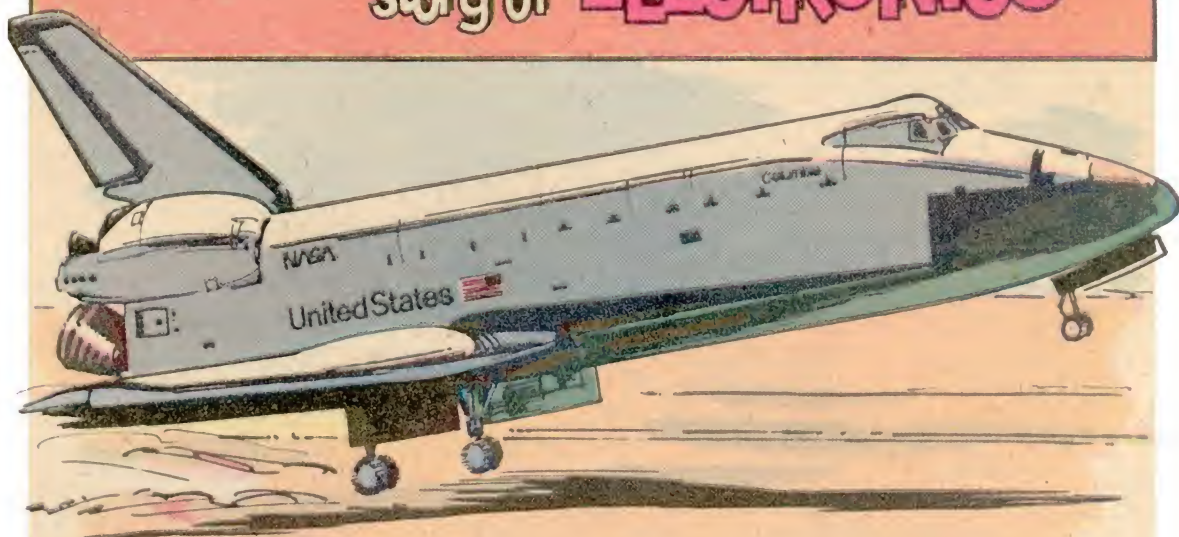
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...the Science Fair[®] story of **ELECTRONICS**

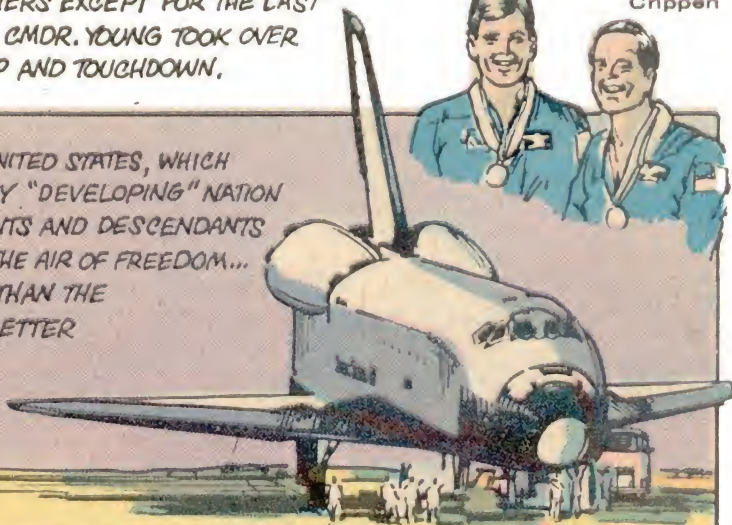
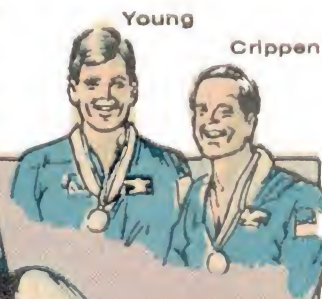


A time to be proud!

SPACE TRAVEL TOOK A GIANT STEP FORWARD ON TUESDAY, APRIL 14, 1981, WHEN THE U.S. NASA SPACE SHUTTLE, **COLUMBIA**, TOUCHED DOWN ON ROGERS DRY LAKE AT EDWARDS AIR FORCE BASE IN CALIFORNIA. A PERFECT FLY-IN FROM SPACE! ANOTHER WORLD RECORD FOR THE UNITED STATES!

THE 200,000 POUND SPACESHIP, PILOTED BY U.S. ASTRONAUTS **JOHN W. YOUNG** AND **ROBERT L. CRIPPEN**, WAS GUIDED THROUGH MOST OF THE LANDING BY COMPUTERS EXCEPT FOR THE LAST FEW MINUTES OF THE FLIGHT WHEN CMDR. YOUNG TOOK OVER THE CONTROLS FOR RUNWAY LINEUP AND TOUCHDOWN.

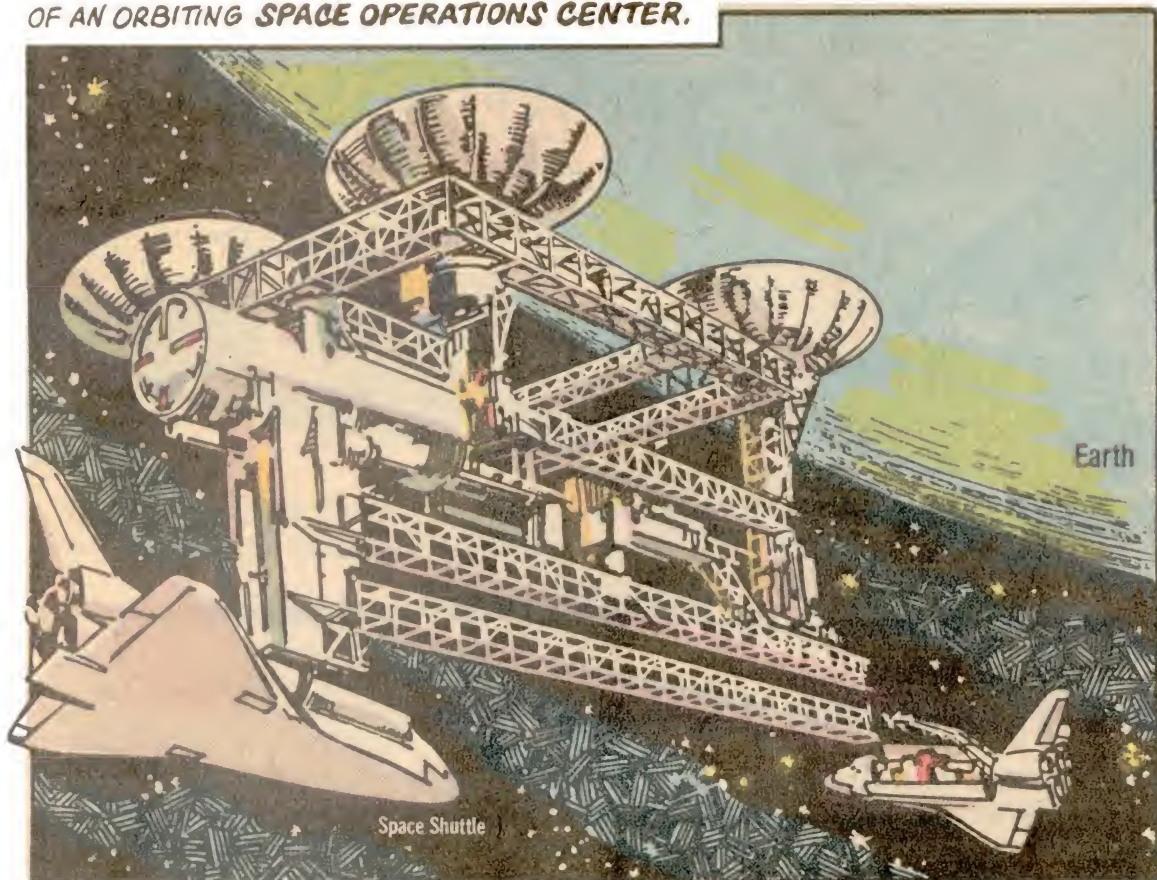
IT WAS A GREAT DAY FOR THE UNITED STATES, WHICH ONLY 205 YEARS AGO WAS A TINY "DEVELOPING" NATION — A NATION BUILT BY IMMIGRANTS AND DESCENDANTS OF IMMIGRANTS WHO BREATHED THE AIR OF FREEDOM... WHO ASKED FOR NOTHING MORE THAN THE OPPORTUNITY TO WORK FOR A BETTER WAY OF LIFE.



CAT. NO. 68-2028

Fall-Winter 1981, Spring 1982 edition of the Science Fair STORY OF ELECTRONICS—the DISCOVERY THAT CHANGED THE WORLD! William M. Palmer, Editor. Published by the Radio Shack Division of Tandy Corporation, One Tandy Center, Fort Worth, Texas 76102, U. S. A. Copyright © 1981 by Tandy Corporation, One Tandy Center, Fort Worth, Texas 76102, U. S. A. All rights reserved. Narrative by William M. Palmer. Graphics by J. & R. Weathers/Designers, Chicago. First printing September 1981. Printed in the U. S. A. Nothing may be reprinted in whole or in part without written permission from the publisher.

THE SUCCESSFUL FLIGHT OF THE U.S. SPACE SHUTTLE, **COLUMBIA**, BRINGS THE WORLD CLOSER TO SPACE CONSTRUCTION PROJECTS LIKE THIS ARTIST'S CONCEPT OF AN ORBITING **SPACE OPERATIONS CENTER**.

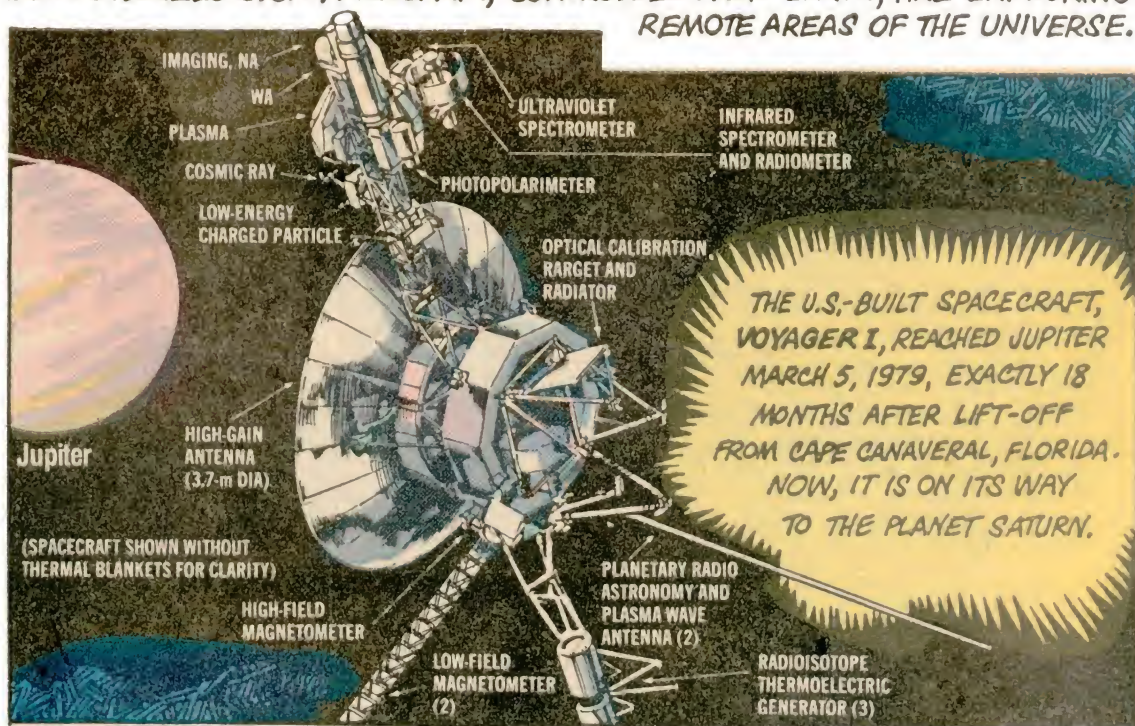


THE SPACE SHUTTLE CAN BE USED TO FERRY WORKERS AND PARTS AND EQUIPMENT FROM EARTH TO THE CONSTRUCTION SITES IN SPACE.

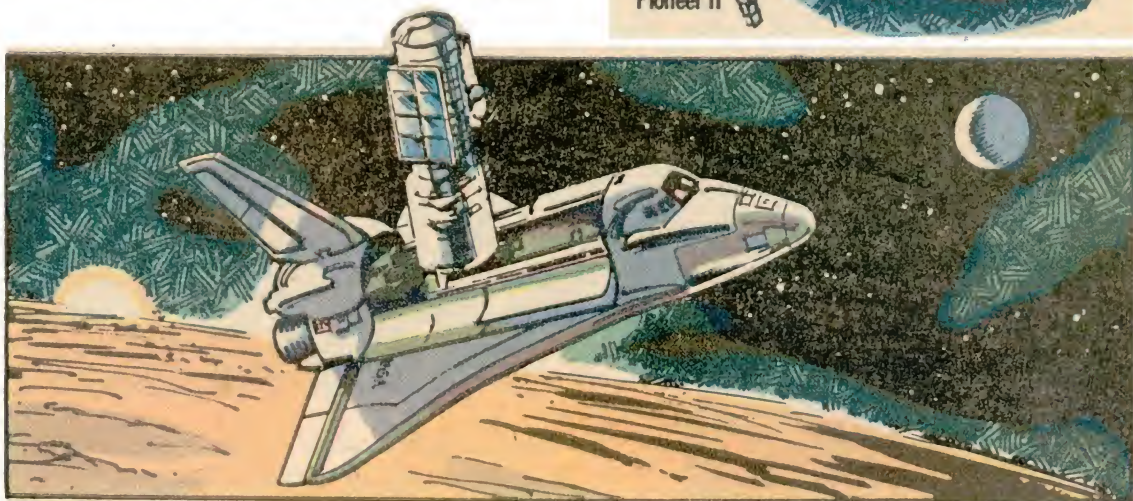
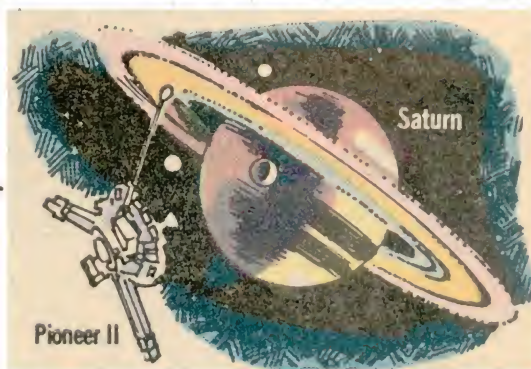


PRESENT SPACE CONSTRUCTION STUDIES INDICATE THAT, BY THE YEAR 2000... LESS THAN TWO DECADES AWAY... MANNED CONSTRUCTION BASES, OR FACTORIES, WILL BE ABLE TO SUPPORT AS MANY AS 500 "ASTROWORKERS," WITH LIVING SECTIONS WHICH WILL INCLUDE A MOTEL, CAFETERIA, AND OTHER SERVICES SIMILAR TO THOSE FOUND ON AN OCEAN LINER!

COMPUTERIZED U.S. SPACECRAFT, CONTROLLED FROM EARTH, ARE EXPLORING REMOTE AREAS OF THE UNIVERSE.

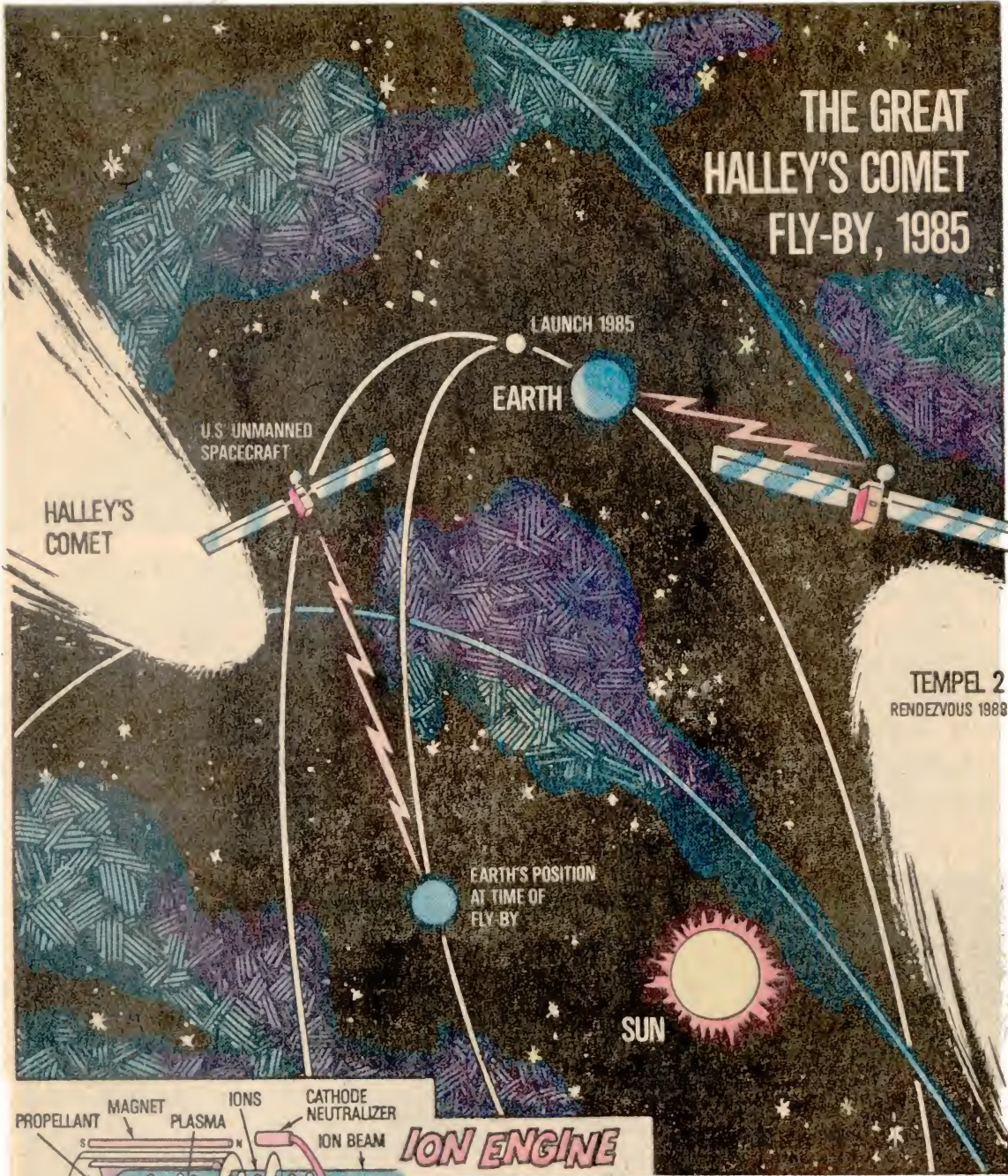


MANKIND'S FIRST CLOSE-UP PICTURES OF THE PLANET SATURN CAME FROM CAMERAS OF THE U.S. SPACECRAFT PIONEER II ON SEPTEMBER 1, 1979. VOYAGER I AND VOYAGER II SPACECRAFT WILL REACH SATURN IN 1980 AND 1981. AND REMEMBER, RADIO, TELEVISION, AND COMPUTERS HAVE MADE THIS POSSIBLE.



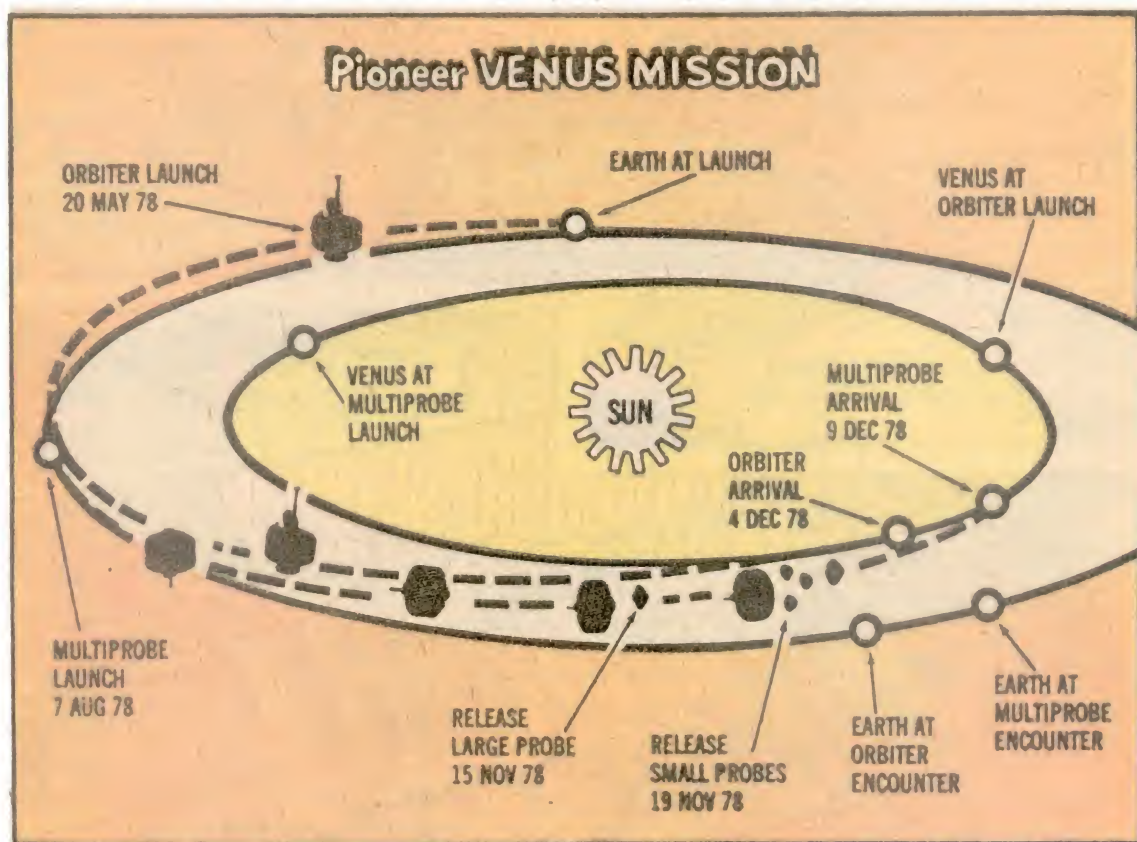
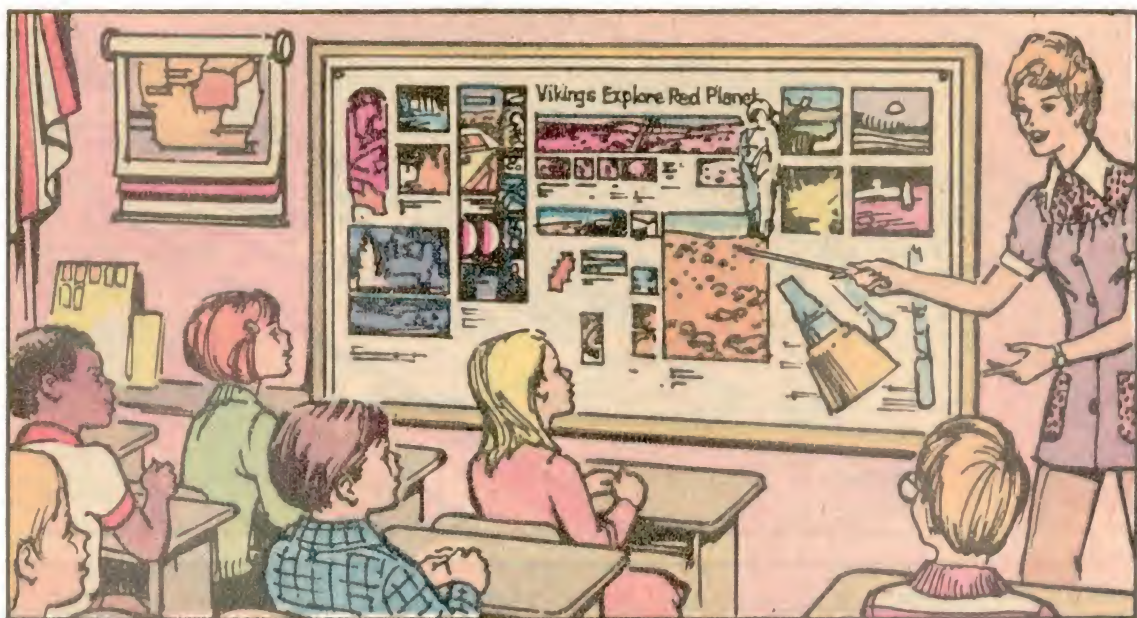
THE U.S. NASA SPACE TELESCOPE IS SCHEDULED TO BE LAUNCHED INTO ORBIT 300 MILES ABOVE THE EARTH BY THE SPACE SHUTTLE "ORBITER" IN 1983. IT WILL SEND TO SCIENTISTS ON EARTH WHAT IT SEES AS IT LOOKS DEEPER INTO SPACE THAN MANKIND HAS SEEN BEFORE.

AN EXCITING EVENT WILL TAKE PLACE IN 1985 WHEN FAMOUS HALLEYS COMET PASSES EARTH ON ITS 76-YEAR ORBITAL VOYAGE! AFTER BEING BOOSTED OUT OF EARTH ORBIT, A U.S. UNMANNED SPACECRAFT WILL BE NUDGED WITHIN PROBE RANGE OF THE COMET BY ION ENGINES (ELECTRICALLY CHARGED BEAMS), PIONEERED BY HUGHES AIRCRAFT COMPANY.



... THREE YEARS LATER, THE SPACECRAFT, PUSHED DEEPER INTO SPACE BY ITS LIGHTWEIGHT, SUN-POWERED ION ENGINES, WILL RENDEZVOUS WITH ANOTHER COMET, TEMPEL 2, IN 1988 TO STUDY IT AT CLOSE RANGE!

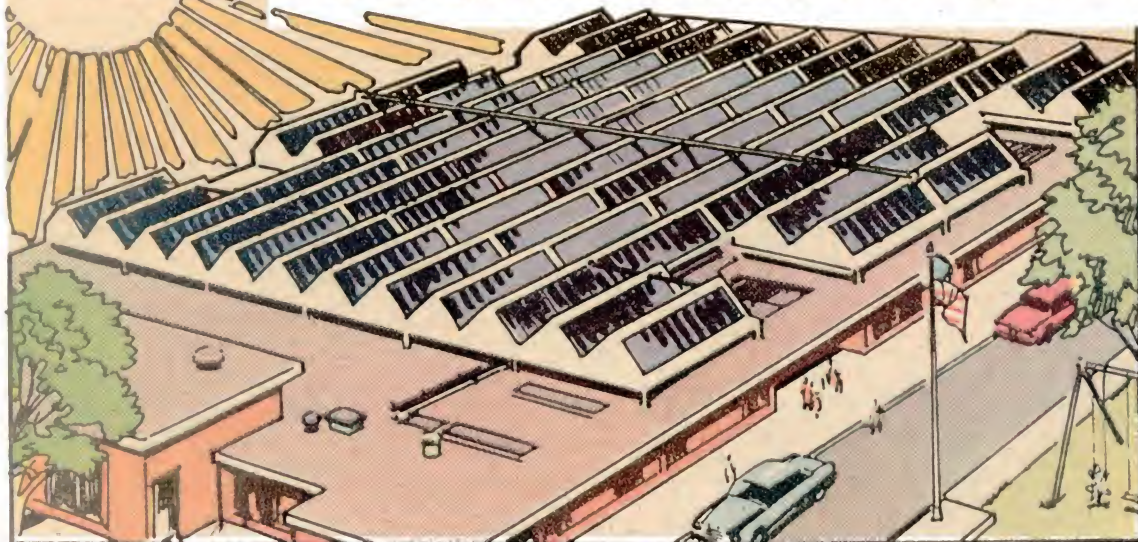
OUR KNOWLEDGE OF **SOLAR** AND OTHER FORMS OF ENERGY HAVE BEEN GREATLY ADVANCED BY DISCOVERIES MADE BY THE U.S. NASA SPACE EXPLORATION PROGRAM — A BENEFIT TO ALL MANKIND IN THE YEARS AHEAD.



THE U.S.-BUILT **PIONEER VENUS** SPACECRAFT WAS THE FIRST PROJECT WITH THE MAIN PURPOSE OF STUDYING THE ATMOSPHERE AND WEATHER OF ANOTHER PLANET. ITS FINDINGS MAY HELP SCIENTISTS LEARN MORE ABOUT THE FORCES THAT AFFECT EARTH'S WEATHER.

SOLAR POWER

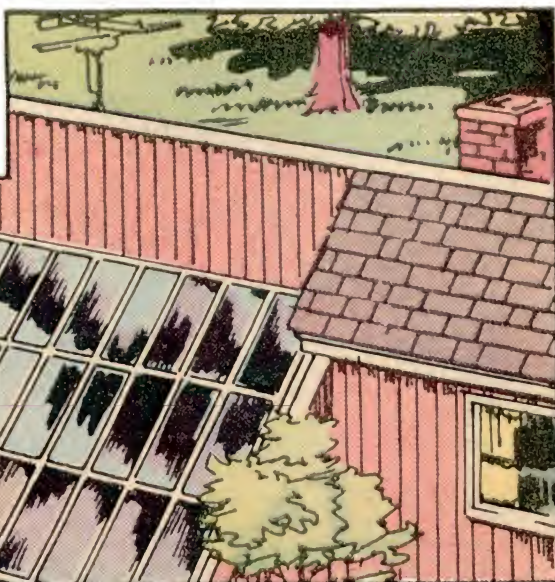
ONE OF THE NATION'S LARGEST **SOLAR** HEATING AND COOLING SYSTEMS HAS BEEN IN OPERATION SINCE 1975 AT THE GEORGE A. TOWNS ELEMENTARY SCHOOL IN ATLANTA, GEORGIA.



THIS SOLAR POWER TEST PLANT HAS 2000 MIRRORS WHICH REFLECT SOLAR HEAT TO A CENTRAL RECEIVER, PRODUCING STEAM TO OPERATE AN ELECTRICITY-PRODUCING TURBINE.

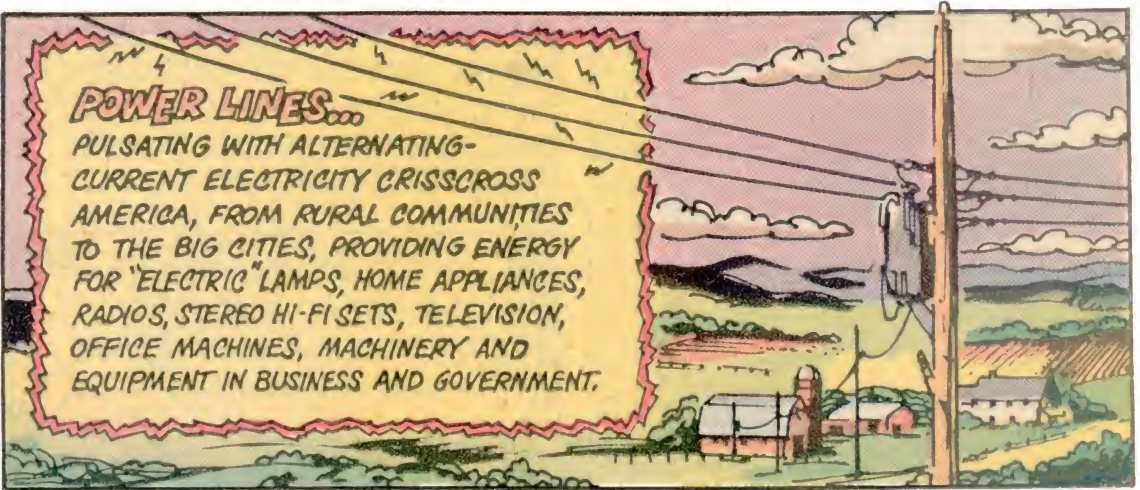
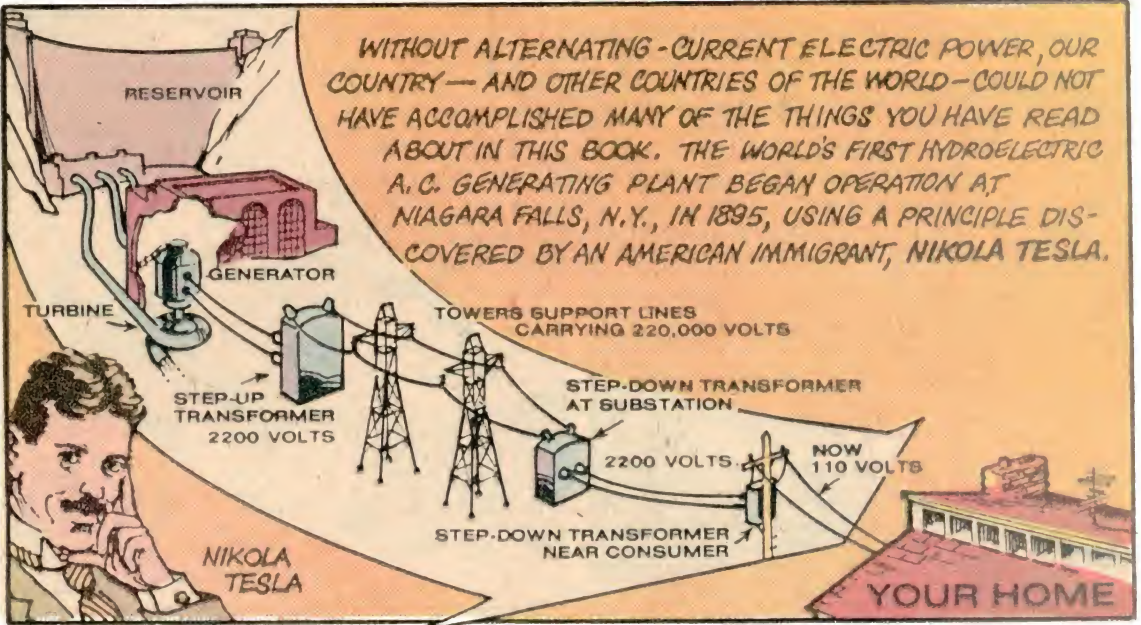
"SOLAR ONE"
near Barstow, California

Projected generating
power: 10 million watts

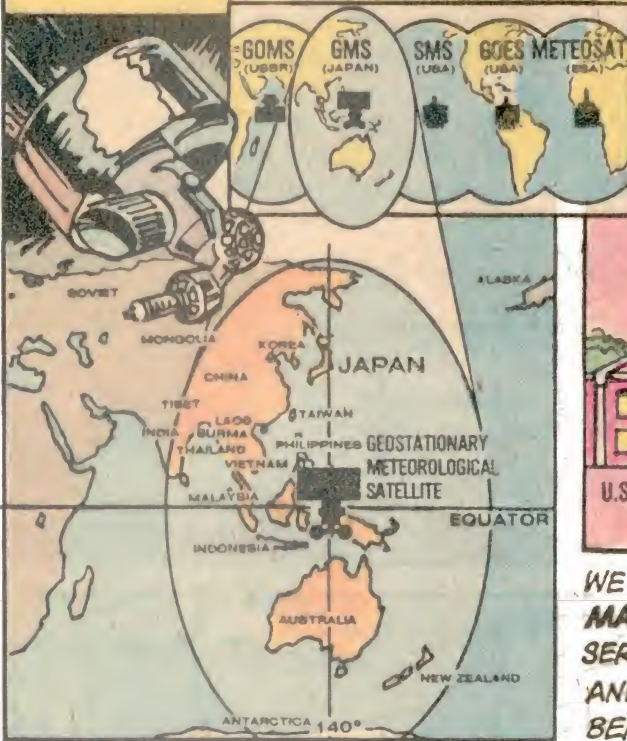


TODAY, SOLAR HEAT-COLLECTING PANELS ARE INSTALLED ON THE ROOFS OF MANY NEW HOMES BEING BUILT IN AMERICA. THE SOLAR ENERGY PROVIDES HOT WATER AND HEATING OF THE ROOMS.

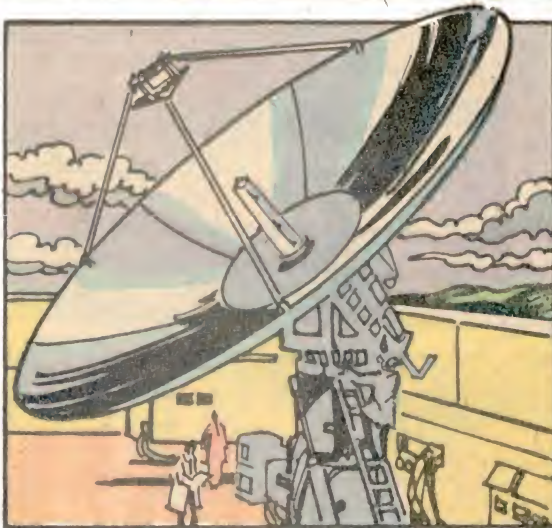
TODAY, THE UNITED STATES PRODUCES AND CONSUMES A THIRD OF THE WORLD'S ELECTRIC ENERGY TO GIVE ITS CITIZENS THE BEST STANDARD OF LIVING EVER ACHIEVED BY MANKIND, AND WE MUST CONTINUE TO EXPLORE THE FORCES OF NATURE FOR NEW SOURCES OF ENERGY.. SOLAR POWER, COAL, GAS, STEAM FROM GEYSERS, WATER-POWER, NUCLEAR POWER... TO TURN THE TURBINES THAT PRODUCE OUR ELECTRICITY.



THE WORLD METEOROLOGICAL ORGANIZATION NOW HAS A "WORLD WEATHER WATCH" PROGRAM TO KEEP PEOPLE AROUND THE WORLD INFORMED ABOUT STORM AND WEATHER MOVEMENTS. EARLY STORM WARNINGS CAN SAVE LIVES AND REDUCE PROPERTY DAMAGE.



WE MAY SOON HAVE OVERSEAS SATELLITE MAIL, USING AIR ELECTRONIC MESSAGE SERVICE BETWEEN THE UNITED STATES AND OVERSEAS LOCATIONS — ANOTHER BENEFIT OF OUR SATELLITE AND SPACE EXPLORATION PROGRAM.

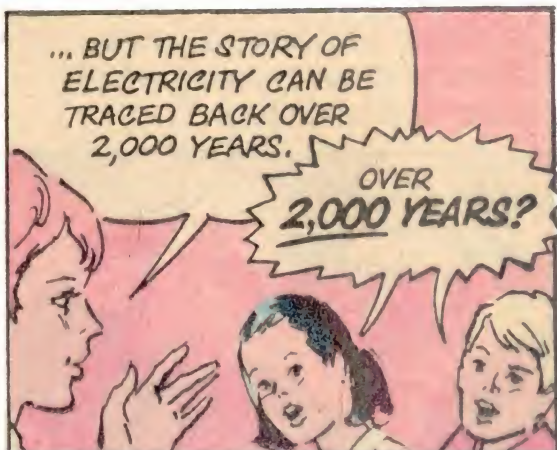


MOBILE SATELLITE GROUND STATIONS SENDING ELECTRONIC SIGNALS TO SATELLITES ABOVE THE EARTH LET US SEE WORLDWIDE EVENTS LIKE THE OLYMPIC GAMES ON COLOR TELEVISION... AND NEWS AND CULTURAL PROGRAMS.





AS EARLY AS 600 B.C., **THALES OF MILETUS**, GREECE, THEORIZED A CONNECTION BETWEEN ELECTRICITY AND MAGNETISM, THE ANCIENTS EVEN TRIED ELECTRIC SHOCKS FROM **EELS** AS A TREATMENT FOR RHEUMATIC DISEASES.



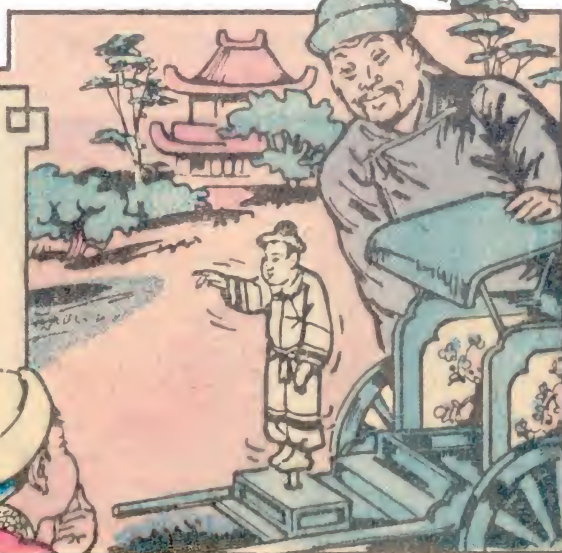
THAT'S RIGHT! AND WHILE WE DON'T KNOW FOR SURE, IT MIGHT HAVE BEGUN LIKE THIS —



AN ANCIENT "**ELECTRIC BATTERY**" UNEARTHED IN IRAQ IN 1936 MAY HAVE BEEN USED IN ELECTROPLATING OVER 2000 YEARS AGO.

THE GREAT JAPANESE ENCYCLOPEDIA OF 1712 IS SAID TO SHOW A PICTURE OF A "**SOUTH POINTING CART**" USED IN CHINA IN THE 5TH CENTURY A.D.

— A **MAGNET** IN ITS EXTENDED ARM CAUSED A JADE MANIKIN TO TURN ON A PIVOT — PERHAPS A FORERUNNER OF THE COMPASS USED BY SHIPS.



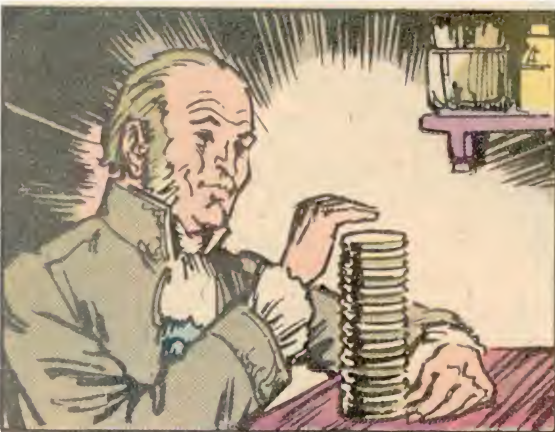
IN 1600 A.D., **GILBERT** PUBLISHED THE FIRST SCIENTIFIC STUDY OF ELECTRICITY AND MAGNETISM, CALLED "DE MAGNETE."



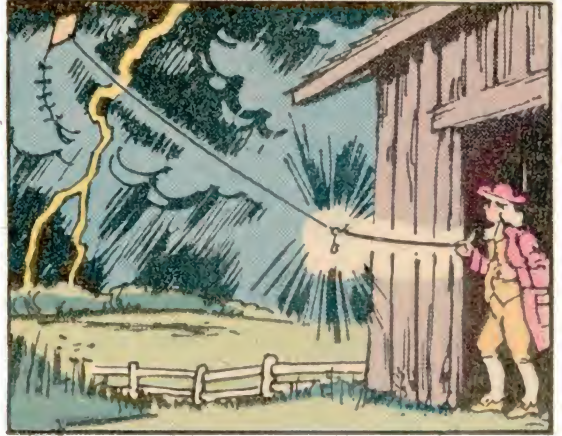
HE LEARNED IT WAS, AND THEN DEvised HIS LIGHTNING ROD SYSTEM TO GROUND DAMAGING ELECTRIC CHARGES — USED ON HOMES AND OTHER BUILDINGS TO THIS DAY.



AN IMPROVED BATTERY DESIGN WAS MADE BY **ALESSANDRO VOLTA** IN 1800. OTHER INVENTORS MADE IMPROVEMENTS LATER.



BENJAMIN FRANKLIN SET OUT TO DISCOVER IF NATURAL LIGHTNING WAS THE SAME STUFF AS ELECTRICITY IN HIS FAMOUS KITE AND WIRE EXPERIMENT.

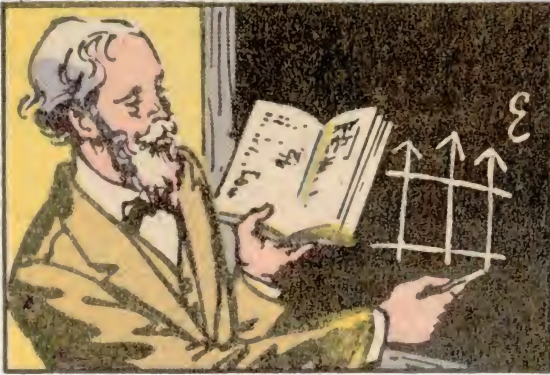


FRANKLIN ALSO ORIGINATED THE "PLUS" AND "MINUS" SIGNS WE USE TO INDICATE ELECTRICAL POLARITY. YOU'LL SEE THESE SIGNS ON FLASHLIGHT BATTERIES.



LATER, **FARADAY** DEVISED THE FIRST MACHINE TO MAKE ELECTRICITY FROM MECHANICAL ENERGY. IT WASN'T VERY EFFICIENT ... BUT IT WORKED!

ABOUT THIS TIME, **MAXWELL** WAS STUDYING THE WORKS OF FARADAY, DAVY, AND OTHERS. HIS MATHEMATICS PREDICTED "ELECTROMAGNETIC DISTURBANCES" IN SPACE ...



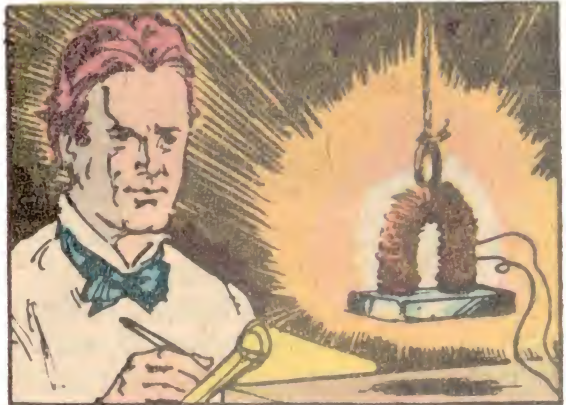
...**HERTZ** FOUND A WAY TO CREATE THE "DISTURBANCES" STUDIED BY MAXWELL, AND SHOWED THEY BEHAVED IN THE SAME WAY AS LIGHT! IT WAS THE BEGINNING OF "WIRELESS" (RADIO).



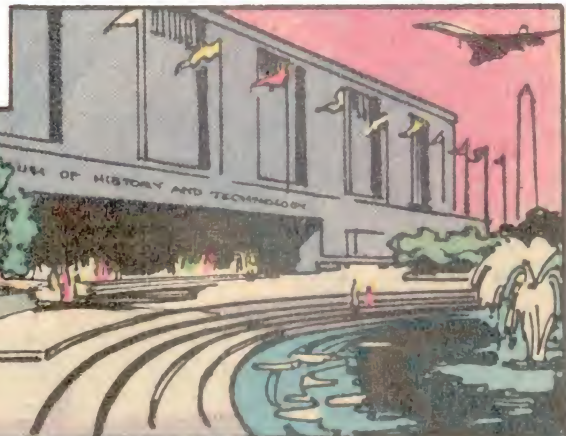
GEE! AN AWFUL LOT OF PEOPLE MUST HAVE STUDIED ELECTRICITY BEFORE ANYBODY COULD ACTUALLY USE IT!

YES, AND THEIR NAMES ARE STILL WITH US. THE "GILBERT" IS A UNIT OF MAGNETISM.

FOR **JOSEPH HENRY**, WHO ALSO BUILT THE FIRST ELECTROMAGNET, LATER USED FOR THE DIRECT CURRENT MOTOR.

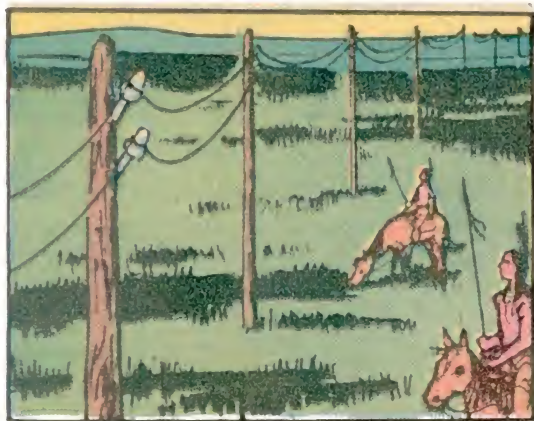


OTHER COMMON ONES ARE: OHM, FARAD, AMPERE, AND HENRY...



IN 1846, **JOSEPH HENRY**, INVENTOR AND TEACHER, BECAME THE FIRST SECRETARY OF THE **SMITHSONIAN INSTITUTION** IN WASHINGTON, D.C. THE SMITHSONIAN WAS ESTABLISHED FROM A GIFT TO THE AMERICAN PEOPLE BY **JAMES SMITHSON** OF SCOTLAND.

IN 1837, AT THE AGE OF 44, **SAMUEL MORSE**, A PORTRAIT ARTIST, BUILT THE FIRST PRACTICAL TELEGRAPH SOUNDER. THE FIRST TELEGRAM, "WHAT HATH GOD WROUGHT," WAS SENT FROM BALTIMORE IN 1844.



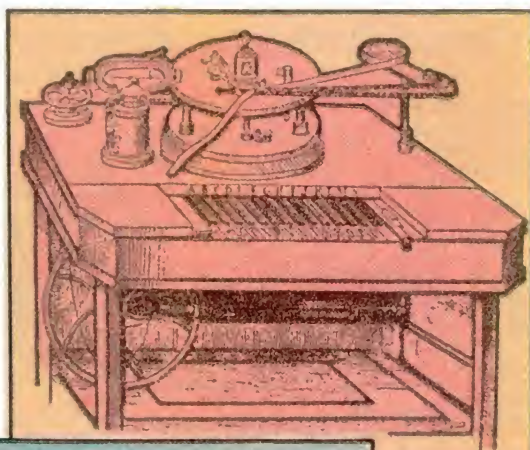
HIS WIRE TELEGRAPH WAS THE FIRST PRACTICAL LONG-RANGE COMMUNICATIONS SYSTEM. IN 1861, **STEPHEN FIELD** SENT THE FIRST TRANSCONTINENTAL TELEGRAPH MESSAGE TO PRES. LINCOLN...

... FROM SAN FRANCISCO, CALIFORNIA TO WASHINGTON, D. C. AND THE YOUNG TELEGRAPH SYSTEM GOT ITS BAPTISM OF FIRE DURING THE U.S. CIVIL WAR WHICH BEGAN THAT YEAR.

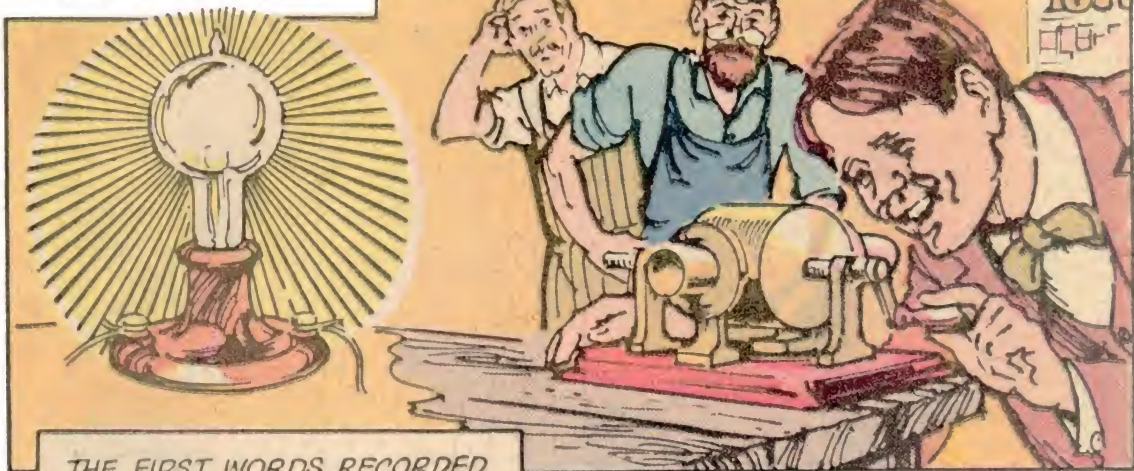


IN JULY, 1861, U. S. GEN. **MCCLELLAN** CLAIMED FIRST USE OF THE TELEGRAPH UNDER ACTUAL BATTLE CONDITIONS. ALSO USED LATER DURING AMERICA'S CIVIL WAR

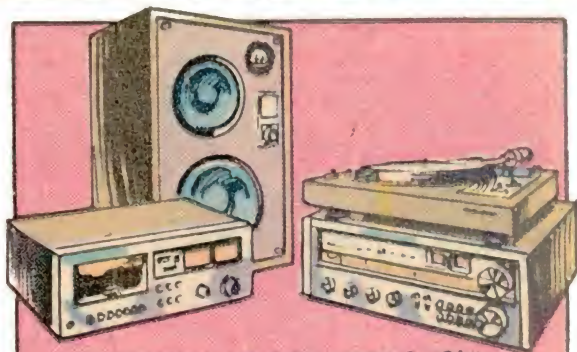
WAS THE **TELEGRAPH PRINTER**, INVENTED BY ROYAL HOUSE OF VERMONT. IT USHERED IN A NEW ERA IN RAPID COMMUNICATIONS.



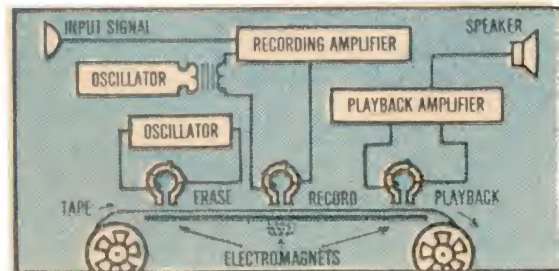
THOMAS EDISON IS BEST REMEMBERED FOR HIS INVENTION OF THE ELECTRIC LIGHT BULB, BUT JUST AS GREAT WAS HIS **PHONOGRAPH** FOR SOUND RECORDING AND PLAYBACK FORERUNNER OF TODAY'S HI-FI STEREO SYSTEMS.



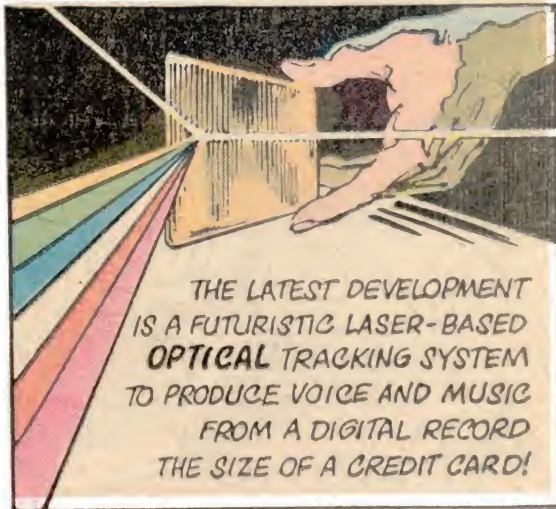
THE FIRST WORDS RECORDED ... AND PLAYED BACK... ON EDISON'S TIN-FOIL RECORD CAME FROM A NURSERY SONG.



A HUNDRED YEARS AFTER THE FIRST PHONOGRAPH, SYSTEMS LIKE THIS CAN RECORD AND PLAY BACK LIFELIKE MUSIC ON A TAPE, ON RECORDS, OR PLAY AM/FM MUSIC OVER ITS RADIO.



MAGNETIC RECORDING WAS INVENTED BY **VALDEMAR POULSEN** IN 1889. TAPE RECORDING WAS DEVELOPED IN THE LATE 1930'S. THIS DIAGRAM SHOWS HOW TAPE IS RECORDED.

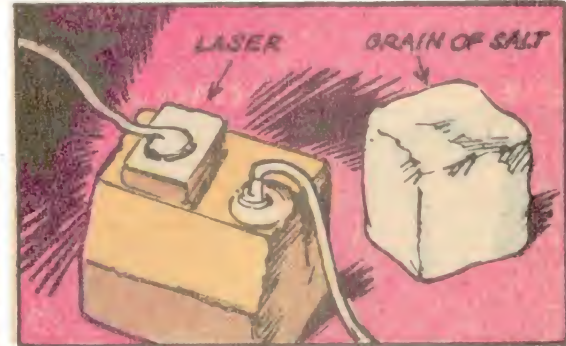
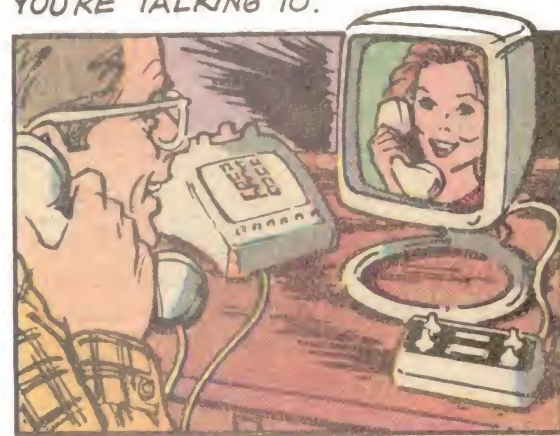


THE LATEST DEVELOPMENT IS A FUTURISTIC LASER-BASED **OPTICAL** TRACKING SYSTEM TO PRODUCE VOICE AND MUSIC FROM A DIGITAL RECORD THE SIZE OF A CREDIT CARD!

BELL'S FIRST TELEPHONE PATENT WAS ISSUED MARCH 7, 1876. JUST THREE DAYS LATER, ON THE TOP FLOOR OF A BOARDINGHOUSE AT NO. 5 EXETER PLACE, BOSTON, MASSACHUSETTS, THE TELEPHONE CARRIED ITS FIRST VOICE SOUND...



SOON MANY TELEPHONES WILL HAVE A "PICTURE PHONE" SO YOU CAN SEE AS WELL AS HEAR THE PERSON YOU'RE TALKING TO.

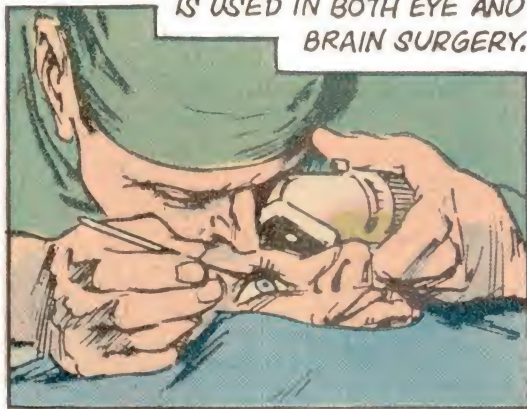


SMALLER THAN A GRAIN OF SALT, THIS SOLID-STATE **LASER** (ARROW) MAKING A LIGHT, THROUGH TINY GLASS FIBERS WILL MAKE IT POSSIBLE TO "TALK BY TELEPHONE OVER A BEAM OF LIGHT." ANOTHER MIRACLE OF SCIENCE!

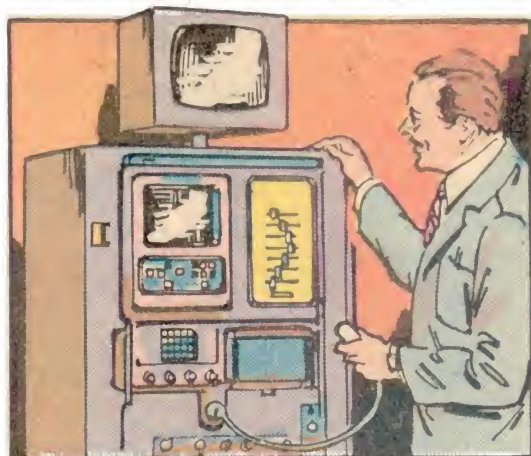
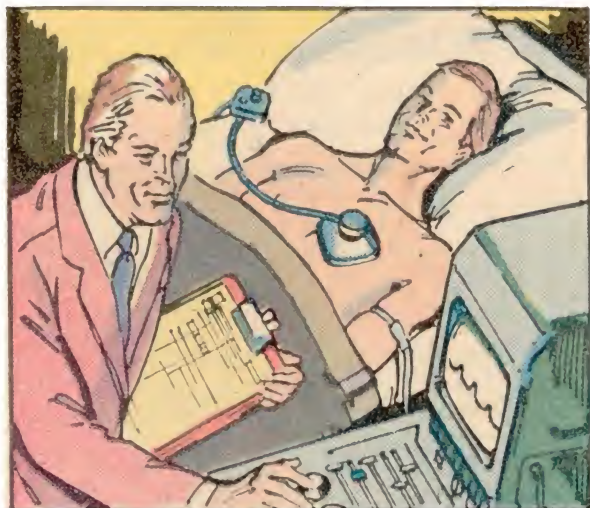
ELECTRICITY AND ELECTRONICS,
WORKING HAND-IN-HAND, ARE
GIVING MANKIND A LONGER,
HEALTHIER AND HAPPIER LIFE...



BECAUSE IT CAN BE CONTROLLED
WITH GREAT ACCURACY, THE LASER
IS USED IN BOTH EYE AND
BRAIN SURGERY.

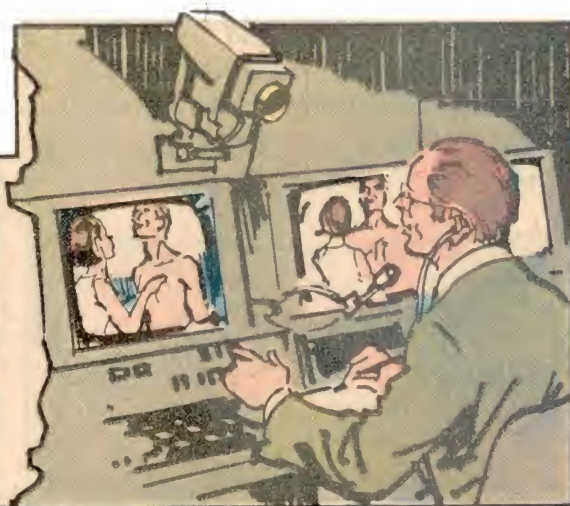
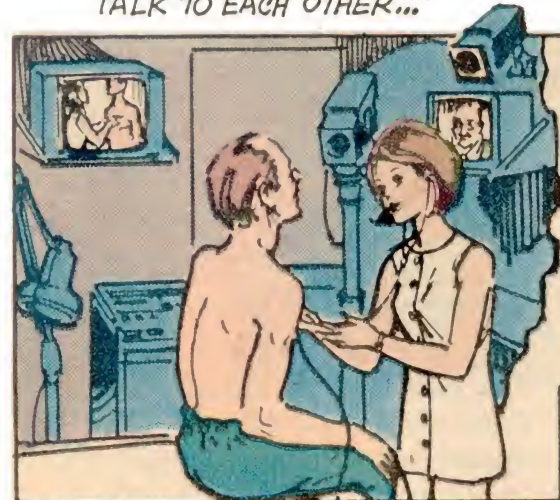


ELECTROCARDIOGRAMS ARE BEING USED
TO HELP DIAGNOSE HEART DISEASE.



A VARIAN ULTRASOUND UNIT ALLOWS
OBSERVATION OF SOFT TISSUE WITHOUT
USE OF X-RAYS... A NEW DISCOVERY
IN DETECTING PHYSICAL AILMENTS.

TELEMEDICINE CLOSED-CIRCUIT TV
LETS DOCTOR AND PATIENT SEE AND
TALK TO EACH OTHER...



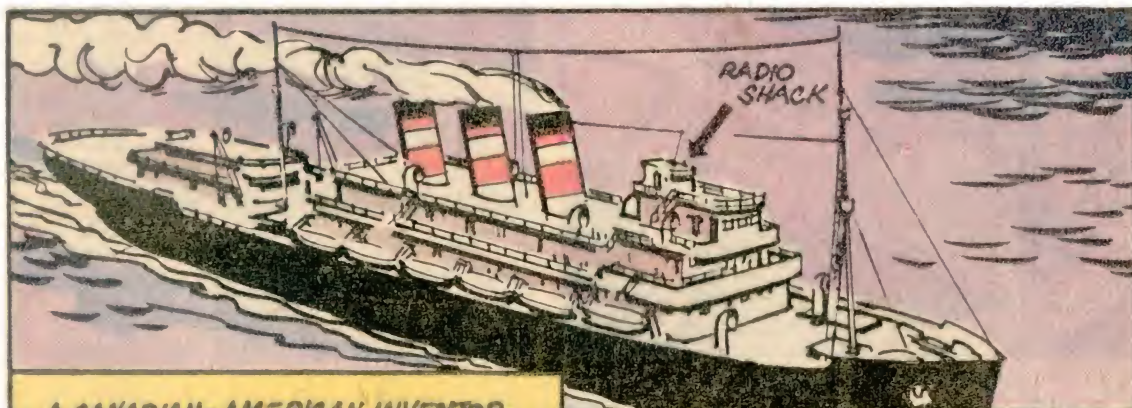
... BY LONG DISTANCE — MAKING A
SPECIALIST'S SERVICES AVAILABLE OVER
WIDER AREAS OF THE COUNTRY.



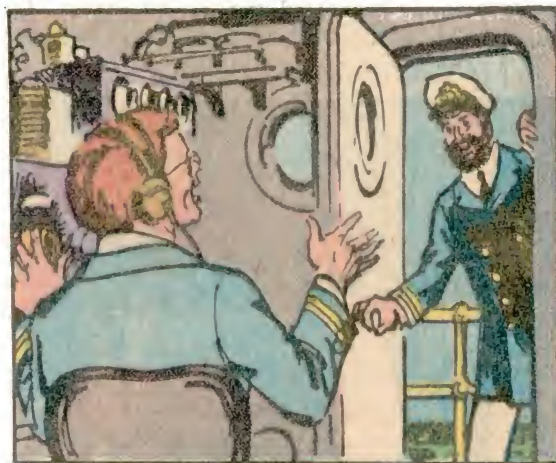
ON DECEMBER 12, 1901, GUGLIELMO MARCONI SENT THE FIRST TRANS-ATLANTIC WIRELESS MESSAGE FROM ENGLAND TO ST. JOHN'S, NEWFOUNDLAND. IT MARKED THE BEGINNING OF LONG-RANGE RADIO COMMUNICATION.



SEVERAL YEARS LATER, SHIPS WERE ADDING A SMALL ROOM TO THE TOP DECK TO HOUSE MARCONI'S WIRELESS RADIO SETS. THIS ROOM WAS CALLED THE "RADIO SHACK" BY SAILORS.



A CANADIAN-AMERICAN INVENTOR, REGINALD FESSENDEN, MADE HISTORY ON CHRISTMAS EVE, 1906, WHEN HE SENT THE FIRST VOICE AND MUSIC BY "WIRELESS" (RADIO)



...HEARD BY MANY AMAZED WIRELESS OPERATORS ABOARD SHIPS AT SEA HUNDREDS OF MILES AWAY.

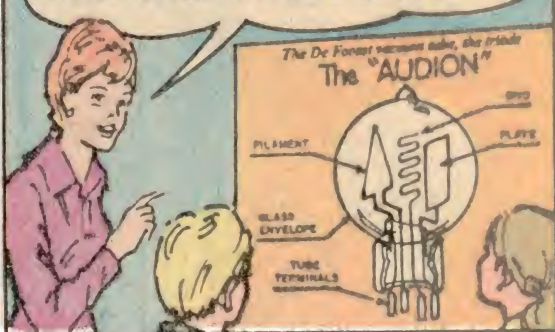


BOB, WHAT REVOLUTIONIZED ELECTRONICS A FEW YEARS AFTER MARCONI'S SUCCESSFUL TRANS-ATLANTIC RADIO TEST?

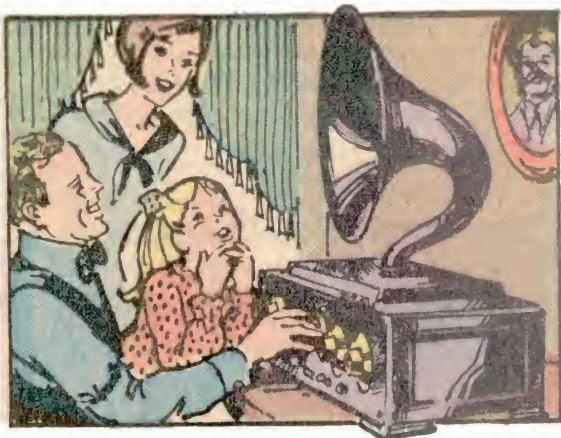
IT WAS THE DE FORREST "AUDION" RADIO TUBE IN 1915. IT MADE POSSIBLE LOUDER SOUND FROM RADIOS.



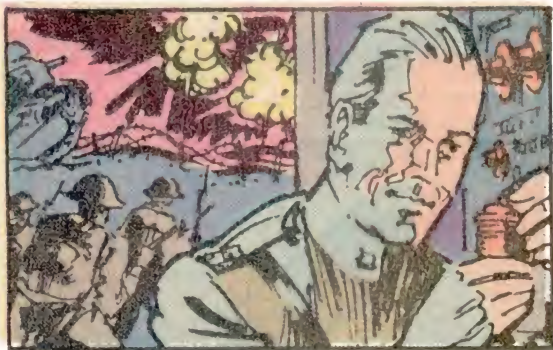
RIGHT, BOB! IN A FEW YEARS, RECEIVERS USING AUDION TUBES REVOLUTIONIZED RADIO LISTENING. —MORE STATIONS COULD BE TUNED IN... EVEN THOSE FAR AWAY!



LEE DE FORREST'S INVENTION OF THE AUDION MARKED THE BEGINNING OF REGULAR RADIO BROADCASTS INTO THE HOME.

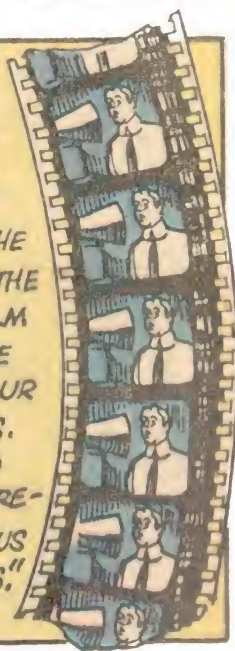


EARLY-DAY RADIO SETS WERE LARGE, AND THE LOUDSPEAKER LOOKED LIKE THE HORN OF A MUSICAL INSTRUMENT.



SOON, EVEN BETTER RADIO SETS WERE MADE. U.S. ARMY MAJ. EDWIN ARMSTRONG DEVELOPED THE SUPERHETERODYNE RECEIVER DURING WORLD WAR I. IT GAVE THE U.S. AND ITS ALLIES A GREAT ADVANTAGE. HE ALSO DEVELOPED FM RADIO DURING THE LATE 1930'S.

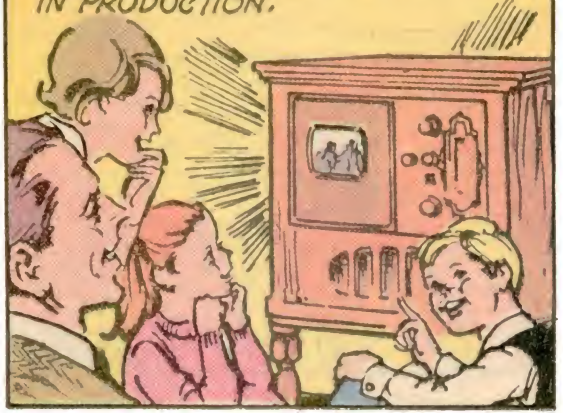
ON JUNE 9, 1922, INVENTOR/EDUCATOR JOSEPH TYKOCINER, (TICK-OH-SHINER), A POLISH IMMIGRANT TO THE U.S., DEMONSTRATED THE FIRST SOUND-ON-FILM MOTION PICTURE... THE PRINCIPLE USED IN OUR MODERN-DAY MOVIES. THE PICTURE SHOWED PROF. ELLERY PAINE RECITING LINCOLN'S FAMOUS "GETTYSBURG ADDRESS."



OTHER FIELDS OF ELECTRONICS BEGAN TO DEVELOP ALSO. IN 1933, KARL JANSKY ANNOUNCED THE DISCOVERY OF RADIO WAVES FROM OUTER SPACE!.. THE BEGINNING OF RADIO ASTRONOMY.



BY 1939, ELECTRONICS WAS A VERY ACTIVE BUSINESS AND INDUSTRIAL FIELD. THERE WERE EVEN SOME SMALL COMMERCIAL TV SETS IN PRODUCTION.



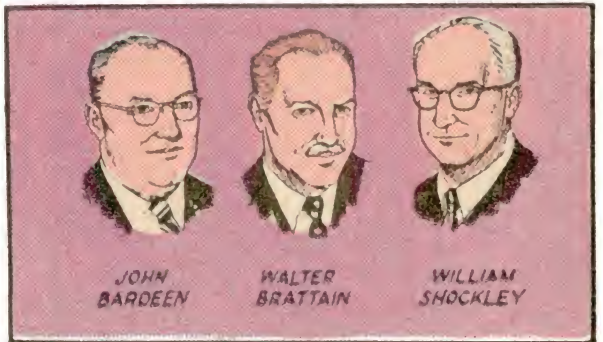
IN THE LATE 1940'S, SCIENTISTS MADE A REVOLUTIONARY DISCOVERY FOR RADIO CIRCUITS. WHAT WAS IT?

I KNOW! IT WAS THE TRANSISTOR IN 1948.

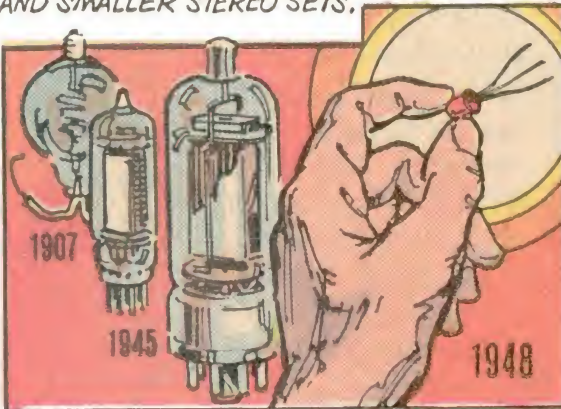


YES, THE NOBEL PRIZE IN PHYSICS WAS SPLIT BETWEEN THREE AMERICANS... FOR INVENTING THE TRANSISTOR:

JOHN BARDEEN, WILLIAM SHOCKLEY, AND WALTER BRATTAIN.



THEIR RESEARCH WAS DONE AT WORLD FAMOUS BELL TELEPHONE LABS. MANY TIMES SMALLER THAN RADIO TUBES, THE TRANSISTOR MADE POSSIBLE POCKET RADIOS, CALCULATORS, AND SMALLER STEREO SETS.

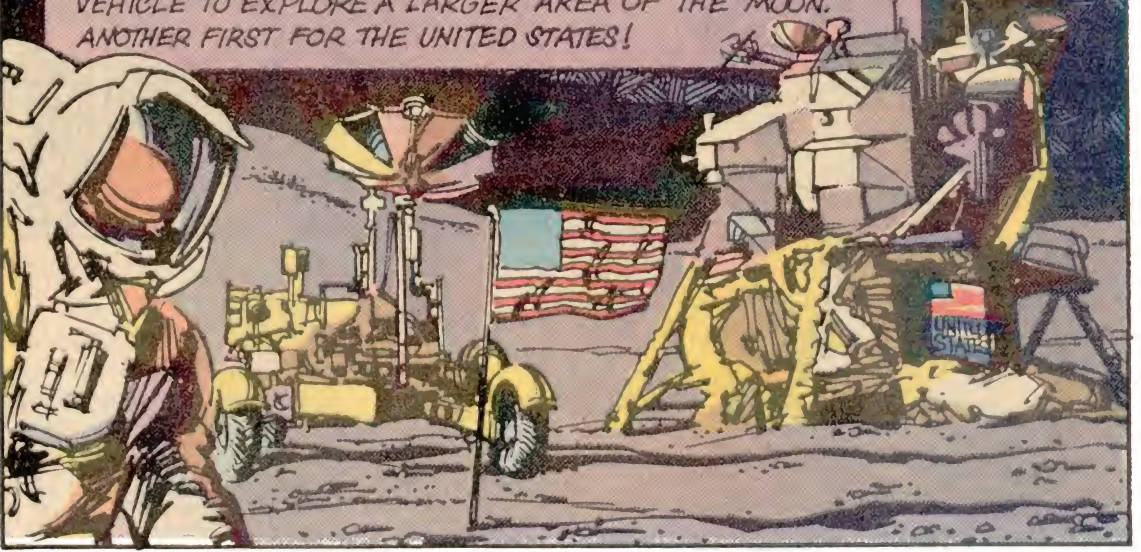


SHOWN BESIDE A COIN TO GIVE YOU AN IDEA OF ITS SMALL SIZE.



NEXT CAME THE COMPACT INTEGRATED CIRCUIT USED IN TODAY'S ELECTRONICS ...COMMUNICATIONS, STEREO HI-FI, AND SMALL, LIGHTWEIGHT COMPUTERS LIKE THE FAMOUS TRS-80.

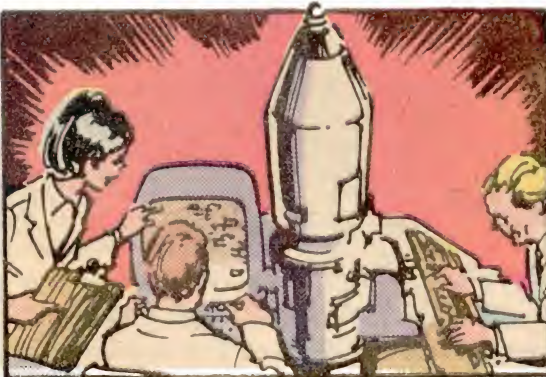
COMPUTERS PLAYED A VITAL ROLE IN HELPING TO LAND THE U.S. LUNAR MODULE "CHALLENGER" AND ITS LUNAR ROVING VEHICLE TO EXPLORE A LARGER AREA OF THE MOON. ANOTHER FIRST FOR THE UNITED STATES!



THE WORLD GREW EVEN SMALLER BY 1972, WHEN PEOPLE AROUND THE WORLD WERE ABLE TO VIEW LIVE TELECASTS OF THE U.S. PRESIDENT'S VISIT TO THE PEOPLE'S REPUBLIC OF CHINA VIA THE U.S.-BUILT **INTELSAT IV** IN ORBIT ABOVE THE EARTH.

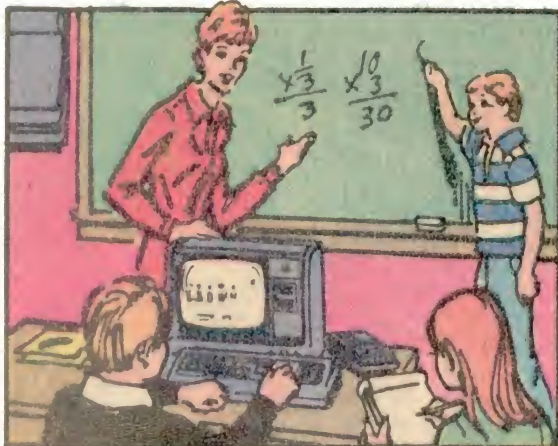


...SCIENCE OPENED A WHOLE NEW WORLD FOR MEDICAL SCIENCE WITH **ZWORYKIN'S** ELECTRON MICROSCOPE. IT VIEWS AN AREA AS MINUTE AS ONE-BILLIONTH OF AN INCH.

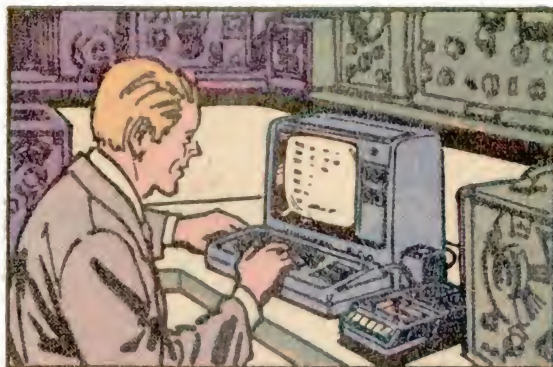
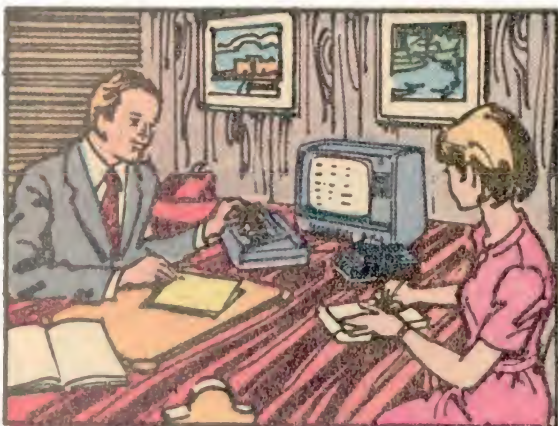


COOKING FOODS WITH MICROWAVE OVENS IS GAINING IN POPULARITY. SAVES TIME IN THE KITCHEN!

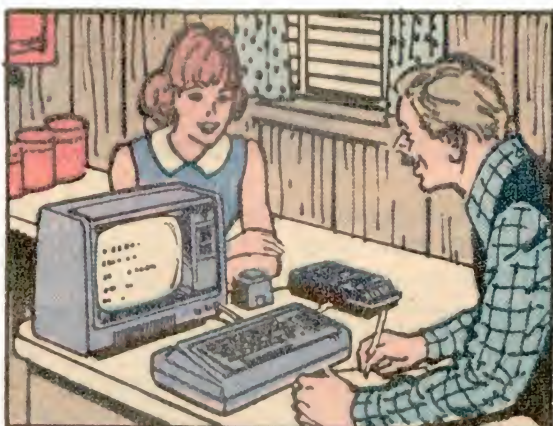
TODAY, THE TRS-80 MICROCOMPUTER, COSTING AS LITTLE AS A CONSOLE TV SET, IS FINDING USES IN TEACHING/LEARNING.



... IN REDUCING TIME AND PAPERWORK FOR SMALL-BUSINESS OPERATIONS...

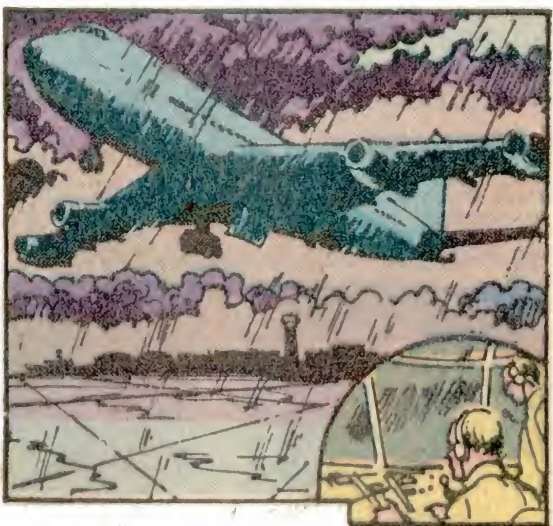


...AS AN AID IN SCIENTIFIC RESEARCH LABORATORY WORK... TO SPEED TESTING AND DESIGN PROCEDURES...

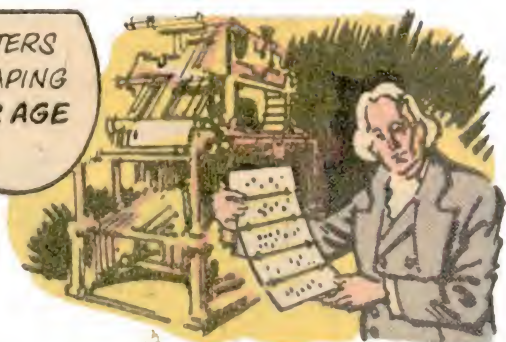
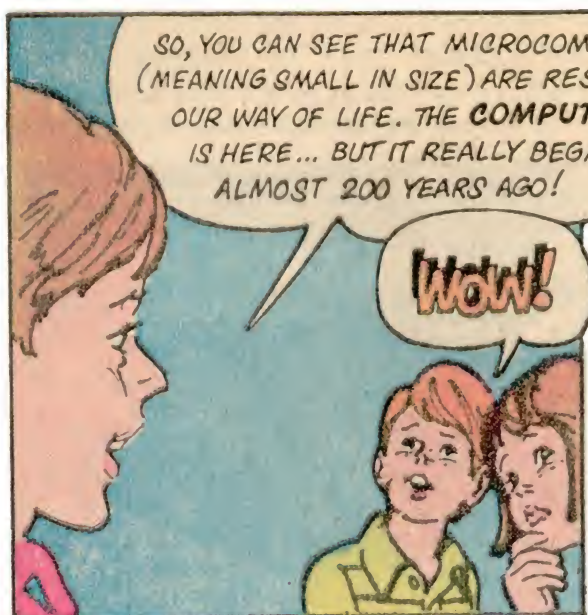


AS WELL AS USE AT HOME ... FOR COMPUTING FAMILY FINANCES AND FOR PLAYING THE NEW TV GAMES.

COMPUTERS WERE DEVELOPED BECAUSE THEY COULD DO ROUTINE WORK FAST AND RELIABLY, EVEN A SMALL COMPUTER REPLACES A ROOM FULL OF CLERKS DOING TEDIOUS AND OFTEN INACCURATE WORK...



COMPUTERS, RADAR, AND OTHER ELECTRONIC COMMUNICATIONS EQUIPMENT MAKE FLYING SAFER IN ANY WEATHER.

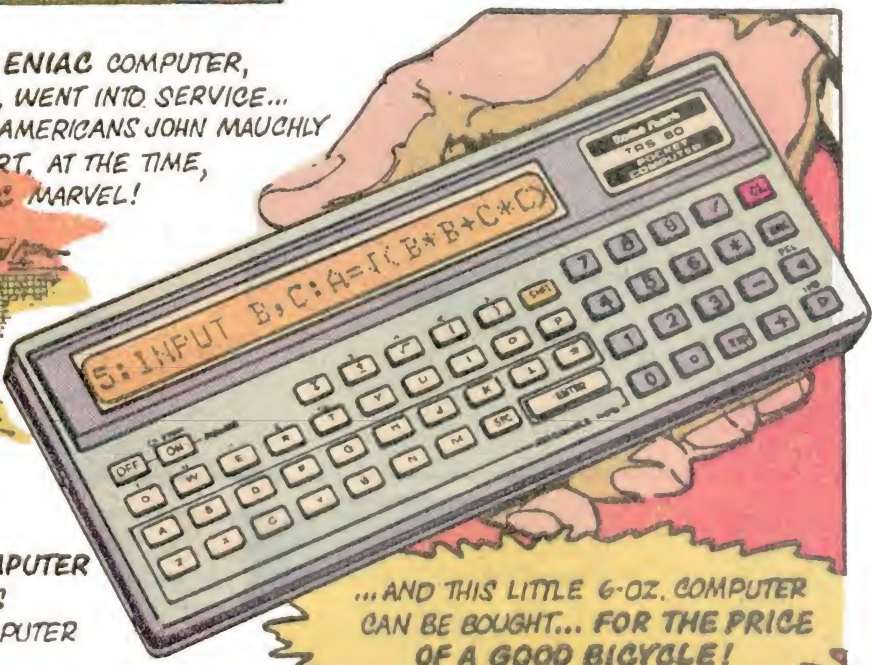


IN 1801, **JOSEPH MARIE JACQUARD**, CALLED THE "FATHER OF THE COMPUTER," WAS HONORED BY THE EXPOSITION IN PARIS FOR A WEAVING LOOM WHICH USED **PROGRAMMED, PUNCHED, CARDS** TO CONTROL THE WEAVING OF COMPLEX PATTERNS FROM THREAD.

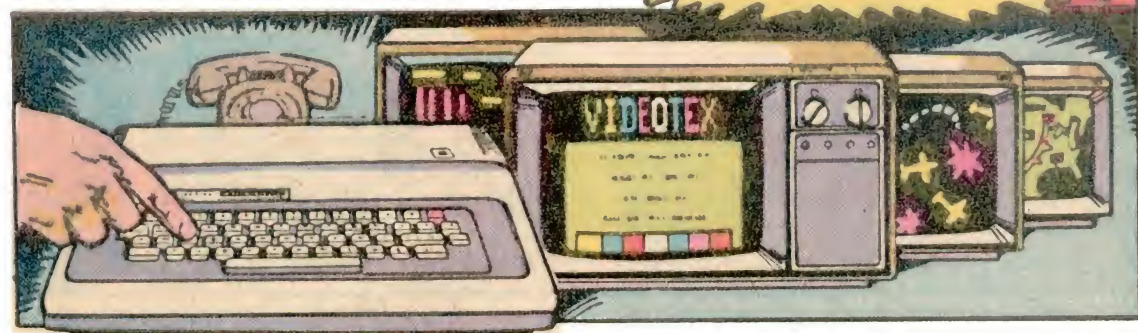
IN 1946, THE 30-TON **ENIAC** COMPUTER, FILLING A LARGE ROOM, WENT INTO SERVICE... THE CO-INVENTION OF AMERICANS JOHN MAUCHLY AND J. PRESPER ECKERT. AT THE TIME, IT WAS AN **ELECTRONIC MARVEL!**



TODAY, A HAND-HELD, BATTERY-POWERED **TRS-80 POCKET COMPUTER** CAN SOLVE PROBLEMS THE "ROOM SIZE" COMPUTER USED TO DO.

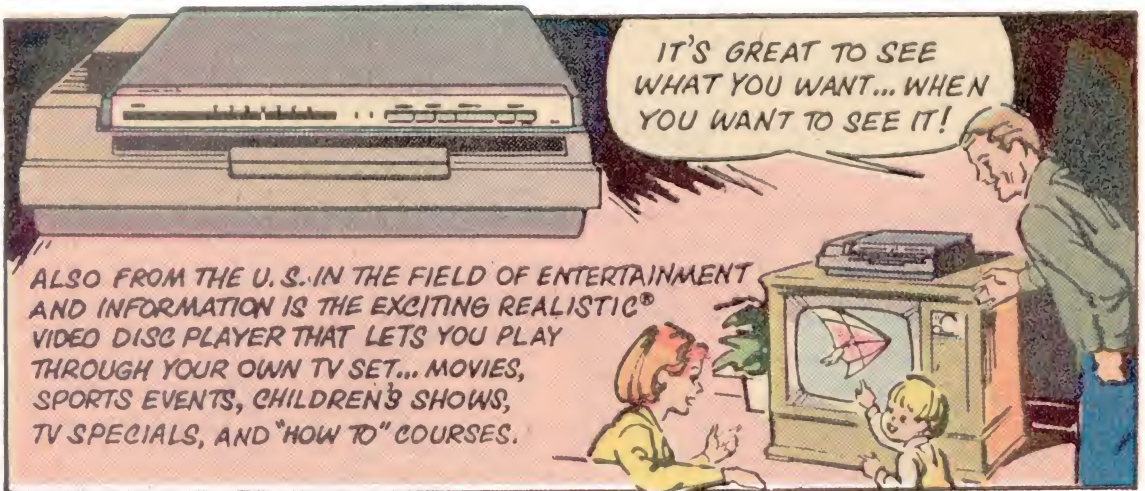
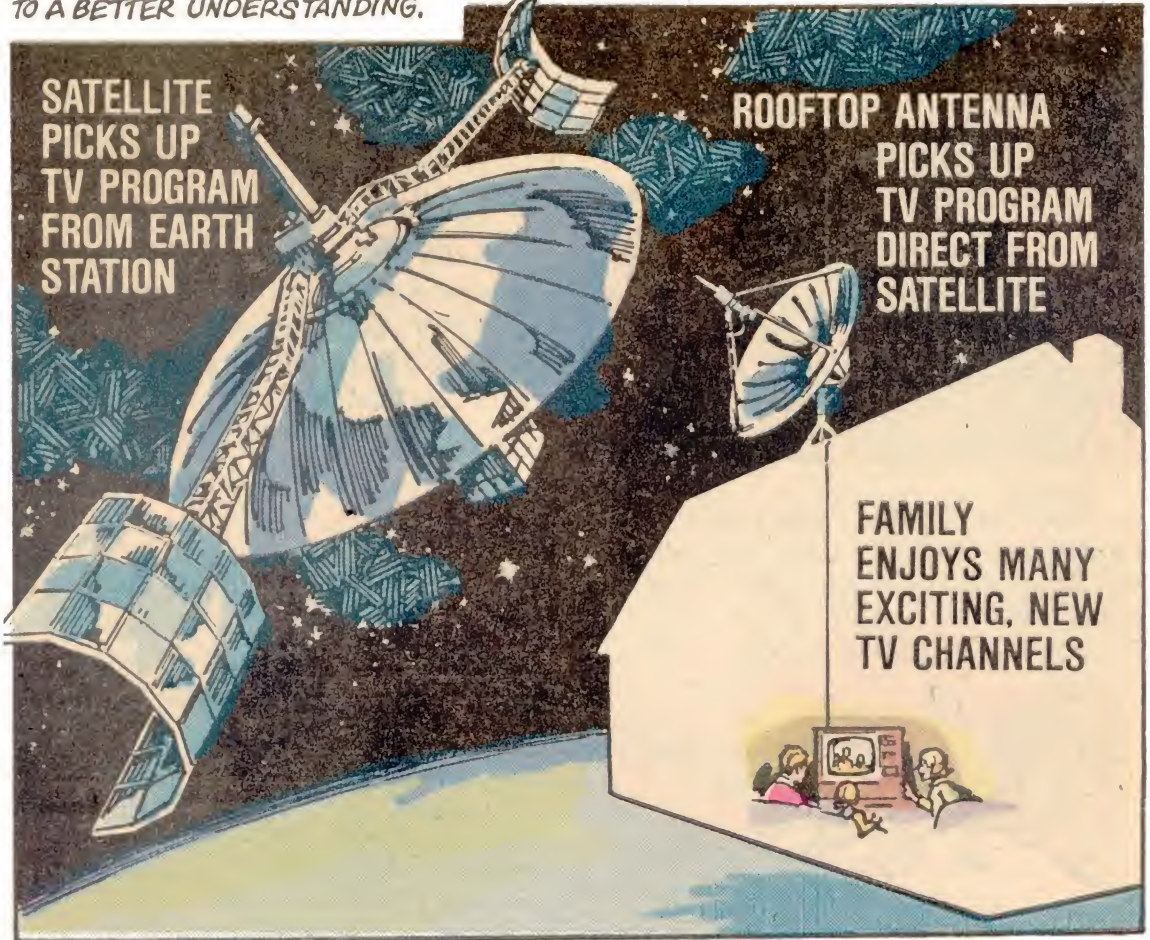


...AND THIS LITTLE 6-OZ. COMPUTER CAN BE BOUGHT... FOR THE PRICE OF A GOOD BICYCLE!



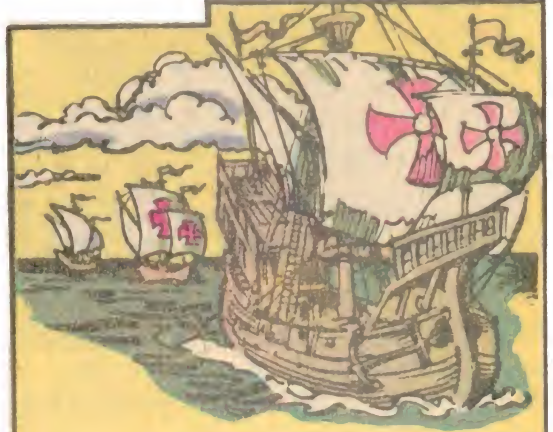
SOMETHING ELSE IS NEW IN COMPUTERS! THE **TRS-80 VIDEOTEX** TERMINAL CAN TURN A BLACK-AND-WHITE OR COLOR TV SET INTO AN INFORMATION RETRIEVAL SYSTEM FOR WEATHER REPORTS, NEWS, BANKING, ELECTRONIC SHOPPING, AND GAMES.

NOW, FAMILIES IN THE U.S. CAN ENJOY, IN THEIR OWN HOMES, SATELLITE-RELATED PROGRAMS FROM AROUND THE WORLD VIA A ROOFTOP "DISH" ANTENNA AND A SPECIAL TERMINAL ATTACHED TO THE TV SET. IT USHERS IN A NEW ERA IN NEWS AND CULTURAL COMMUNICATIONS BETWEEN PEOPLES OF THE WORLD... LEADING, PERHAPS, TO A BETTER UNDERSTANDING.



REMEMBER, THIS BOOK SHOWS ONLY A FEW OF THE DISCOVERIES MADE BY THE UNITED STATES — A NATION WHICH ONLY 205 YEARS AGO WAS WHAT WE CALL TODAY A "DEVELOPING" NATION. THE FUTURE IS EVEN BRIGHTER... IF WE CONTINUE TO EXPLORE, TO DISCOVER, TO INVENT... IF WE CONTINUE TO USE AN OPPORTUNITY BORN IN FREEDOM!

THE STORY YOU HAVE JUST READ BEGAN COUNTLESS CENTURIES AGO BECAUSE OUR ANCESTORS HAD A NATURAL CURIOSITY ABOUT THINGS. EACH GENERATION EXPLORED, OBSERVED, DISCOVERED, INVENTED AND PASSED ALONG TO THE NEXT GENERATION THEIR CONTRIBUTION TO THE BODY OF KNOWLEDGE WE CALL **SCIENCE** ... AND TO A BETTER WAY OF LIFE WE CALL **FREEDOM!**



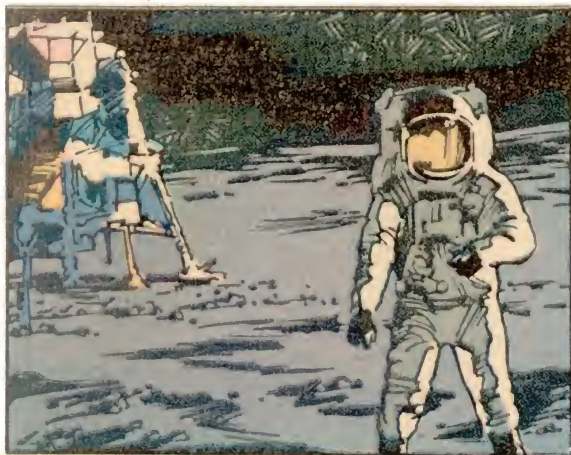
THAT'S WHY
CHRISTOPHER COLUMBUS AND
HIS DARING EXPLORERS CROSSED
THE UNCHARTED ATLANTIC OCEAN
IN SEARCH OF A NEW TRADE
ROUTE — FINDING INSTEAD THE
ISLANDS OF THE CARIBBEAN.



THAT'S WHY THE HARDY VIKINGS
SAILED THE NORTHERN STRETCHES
OF THE ATLANTIC OCEAN OVER
TEN CENTURIES AGO — LOOKING
FOR NEW LANDS.



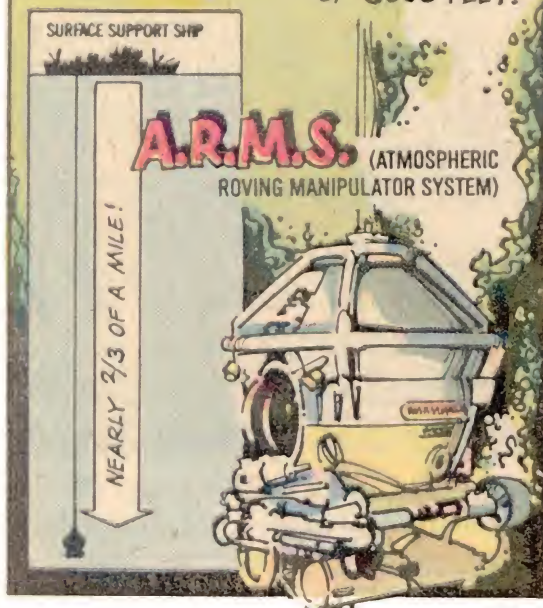
THAT'S WHY THE PILGRIMS CAME
TO AMERICA IN 1620 — SEARCHING FOR
RELIGIOUS FREEDOM AND THE RIGHT
TO GOVERNMENT BY THE PEOPLE.



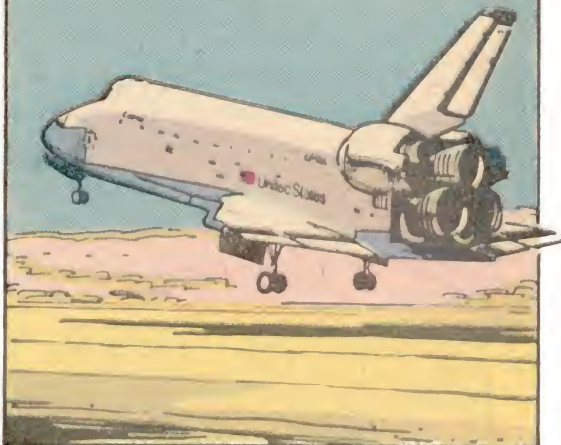
THAT'S WHY AMERICAN SPACE EXPLORERS
NEIL ARMSTRONG AND **EDWIN ALDRIN**
SET THEIR SPACESHIP DOWN ON THE
MOON'S SEA OF TRANQUILLITY IN 1969.



THAT'S WHY, OVER 2000 YEARS AGO,
ALEXANDER OF MACEDON WAS
LOWERED INTO SHALLOW SEAS IN A
GLASS BARREL TO STUDY MARINE LIFE.
AND TODAY, U.S. BUILT PERRY DIVING
BELLS ARE TAKING DIVERS TO DEPTHS
OF 3000 FEET!



THAT'S WHY U.S. ENGINEERS
DISCOVERED A WAY TO FLY A
SPACESHIP FROM ORBIT TO
AN EARTH LANDING.



YES, OUR COUNTRY MUST CONTINUE
TO EXPLORE... TO DISCOVER... TO INVENT...
TO PAVE THE WAY FOR FUTURE GENER-
ATIONS. THIS MEANS MANY EXCITING
OPPORTUNITIES FOR YOUNG SCIENCE
EXPLORERS! WOULD **YOU** LIKE
A CAREER IN SCIENCE?



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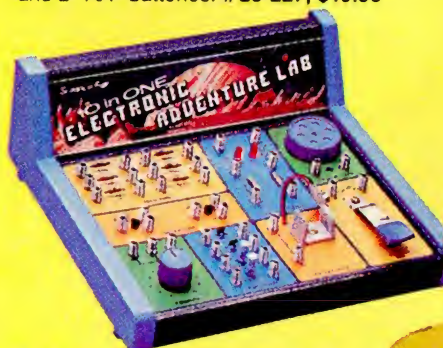
Solar Energy Lab Kit

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50-Project Lab Kit

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